

ASSIGNMENT 2

Textbook Assignment: "Measuring and Repair Instruments" and "Internal Combustion Engines," chapters 2 and 3, pages 2-1 through 3-23.

- 2-1. To ensure accuracy when measuring crankshaft end play, you should take the measurement what minimum number of times?
1. Five
 2. Two
 3. Three
 4. Four
- 2-2. Which of the following procedures is the correct method to follow when opening a micrometer?
1. Hold the frame with one hand and turn the knurled sleeve with the other hand
 2. Twirl the frame
 3. Hold the knurled sleeve with both hands and twirl the frame
 4. Twirl the knurled sleeve
- 2-3. Which of the following statements concerning a bore gauge is NOT correct?
1. It gives a direct measurement
 2. It is one of the most accurate tools for measuring a cylinder bore
 3. It checks the cylinder for out-of-roundness or taper
 4. It has two stationary spring-loaded points and an adjustable point
- 2-4. Why must you expose the bore gauge, the master ring gauge, or other tools used to preset the bore gauge, and the part to be measured to the same environment before measuring?
1. Because it is a good practice to have all the tools and the part to be measured in one place
 2. Because a temperature differential may cause your readings to be inaccurate
 3. Because by doing so, you can check what else you need before starting a measurement
 4. Because by doing so, this will give you some time to read the bore gauge operating manual
- 2-5. A strain/deflection gauge is used for which of the following measurements?
1. Crankshaft run-out
 2. Crankshaft end play
 3. Both 1 and 2 above
 4. Crankshaft alignment
- 2-6. When a strain/deflection gauge is used, readings are generally taken in how many crank positions?
1. Six
 2. Five
 3. Three
 4. Four
- 2-7. Once you have placed the deflection gauge indicator in position for the first reading, you do not touch the gauge until all the required readings are taken and recorded.
1. True
 2. False

- 2-8. What is the most preferred ratio of the torque multiplier?
1. 5 to 1
 2. 2 to 1
 3. 3 to 1
 4. 4 to 1
- 2-9. If you use an extension to a torque adapter, how should the torque applied to the part or fastener compare to the torque indicated on the torque wrench?
1. It will be the same
 2. It will be greater
 3. It will be less
- 2-10. Before you begin an inspection or test of an engine frame or block, what should you do first?
1. Consult the manufacturer's manual because specific procedures vary with different engines
 2. Check the engine's preventive maintenance schedule
 3. Clean the outside of the engine thoroughly
 4. Warm up the engine
- 2-11. A dye penetrant test meets the requirements for quality assurance when it is conducted by what person?
1. A QA inspector
 2. Any qualified person
 3. A certified nondestructive testing technician
 4. A well-trained engineman
- 2-12. Which of the following conditions could indicate a crack in the cylinder liner of an engine?
1. Water standing atop the cylinder's piston after the engine is secured
 2. Abnormally high cooling temperature when the engine is operating
 3. Large amount of water in the lubricating oil
 4. Each of the above
- 2-13. Which of the following is NOT the result of an improperly cooled cylinder liner?
1. Liner failure
 2. Thermal stress
 3. Uneven heating
 4. Fluctuation in rpm
- 2-14. Which of the following conditions is NOT a cause for the liner to be improperly seated?
1. Metal chips
 2. Oversized liner
 3. Nicks or burrs
 4. Improper fillets
- 2-15. Broken piston rings will cause which of the following problems?
1. Scored cylinder liners
 2. Connecting bearing failure
 3. High lube oil temperature
 4. High freshwater temperature
- 2-16. Which of the following symptoms is an indication of a scored cylinder?
1. High compression pressure
 2. Rapid wearing out of strainers and liner parts
 3. Low compression pressure
 4. Cracked or broken piston rings
- 2-17. Which of the following conditions will produce out-of-round cylinder liners?
1. Operating the engine at too low a temperature
 2. Defective main bearing
 3. Piston side thrust
 4. Improperly seated head
- 2-18. How do you determine liner wear?
1. Take piston and liner measurements and get the difference
 2. Take measurements at three levels in the liner
 3. Compare wear of piston rings
 4. Compare compression readings

- 2-19. As a precaution against error, it is a good practice for two persons to take the liner measurement and then compare and check any discrepancy between the two sets of readings.
1. True
 2. False
- 2-20. Which of the following conditions is NOT a cause of abnormal liner wear?
1. Insufficient lubrication
 2. Dirt in the lube oil
 3. Improper starting procedure
 4. High cooling water temperature
- 2-21. Under which of the following conditions are corrosive vapors most likely to condense on the cylinder liner walls of an engine?
1. While operating at temperatures exceeding normal
 2. While operating with the lube oil pressure below normal
 3. While warming up after it is first started
 4. While operating in such a way that normal lube oil pressure is exceeded
- 2-22. You are removing a cylinder liner from an engine. When fastening the special liner puller to the liner studs, why must you tighten the cap nuts by hand instead of by wrench?
1. Because the nuts cannot be reached with a wrench
 2. Because the cylinder liner could be scratched with a wrench
 3. Because threads on both nuts and studs could be damaged by a wrench
 4. Because there is some danger that a wrench could be left in the cylinder liner
- 2-23. You are inspecting a cylinder head for cracks. Which of the following is NOT a correct procedure to use?
1. Perform a compression test
 2. After bringing the piston of each cylinder to top dead center, apply compressed air
 3. Examine by sight or with magnetic powder
 4. Perform the hydrostatic test that is used on a water-jacketed cylinder
- 2-24. The gaskets, which are used between the mating surfaces of the head and the block of an engine, give this joint which of the following characteristics?
1. Acid resistance
 2. Protection against leakage
 3. Rigidity
 4. Correct shape
- 2-25. What should you do if you discover a warped or distorted cylinder head during an inspection?
1. Machine the head to correct tolerance
 2. Replace the head as soon as possible
 3. Overtorque the head to compensate for the warpage
 4. Reduce the load on the engine
- 2-26. Which of the following symptoms does NOT indicate fouling in the combustion chambers?
1. Excessive oil pumping
 2. Smoky exhaust
 3. Loss of power
 4. Low compression
- 2-27. Which of the following valve problems will cause a valve to hang open?
1. Burned valve
 2. Floating valve
 3. Sticking valve
 4. Bent valve

- 2-28. In a two-stroke cycle engine with aluminum pistons, what is the maximum wear limit for the liner?
1. 0.0015 in. per inch diameter
 2. 0.0025 in. per inch diameter
 3. 0.0030 in. per inch diameter
 4. 0.0050 in. per inch diameter
- 2-29. Which of the following conditions will NOT cause cracks on an engine cylinder head?
1. Obstruction in the combustion space
 2. Restriction of cooling passage
 3. Addition of hot water to a cold engine
 4. Improperly tightened studs
- 2-30. What valve casualty is usually caused by resinous deposits left by improper lube oil or fuel?
1. Burned valves
 2. Sticking valves
 3. Weak springs
 4. Bent valves
- 2-31. After inspecting the engine intake valves, you discovered that the surface of the valve head has damage. Which of the following casualties is the most probable cause?
1. It is sticking
 2. It has a weak spring
 3. It is bent
 4. It has a loose valve seat
- 2-32. Which of the following valve casualties will cause the valve to fail to close completely?
1. A burned valve
 2. A valve float
 3. A sticking valve
 4. A valve that has a weak spring
- 2-33. Failure to properly prepare the counterbore area before placing a valve seat insert in it will cause what problem?
1. Uneven heat transfer between the seat and the counterbore
 2. Scratching of the insert
 3. Misalignment of the valve head in the seat
 4. Loose fit of the insert in the counterbore
- 2-34. When replacing a valve seat insert, which of the following procedures should you follow?
1. Plan the operation so that the insert is placed slowly and precisely
 2. Use boiling water to heat the valve seat
 3. Drive the insert down with a special tool
 4. Shrink the valve guides or counterbore with dry ice
- 2-35. Minor pits and flaws may be removed from the valve seat by what method?
1. Buffing
 2. Hand grinding
 3. Insert replacement
 4. Rubbing with prussian blue
- 2-36. How are valves refaced?
1. On a lathe
 2. Against the valve seat
 3. By machine grinding
 4. Each of the above
- 2-37. Which of the following conditions will cause valve springs to break?
1. Compression and corrosion
 2. Misalignment and compression
 3. Corrosion and fatigue
 4. Fatigue and compression

- 2-38. Which of the following defects does NOT warrant valve spring replacement?
1. Loss of 2 percent of length
 2. Damage to protective coating
 3. Hairline cracks
 4. Rust pits
- 2-39. Which of the following results will occur if shims are not properly placed between a valve stem and valve stem cap?
1. Damaged valve stem cap
 2. Damaged or broken valve stem
 3. Dropped valve
 4. Each of the above
- 2-40. What is the most important factor in keeping a properly adjusted valve actuating gear in good condition?
1. Minimum clearance
 2. Control of corrosion
 3. Proper materials
 4. Adequate lubrication
- 2-41. If the threads on a rocker arm adjusting screw become worn, what must you do?
1. Replace the rocker arm, screw, and locknut
 2. Replace the screw only
 3. Replace the screw and locknut only
 4. Dress the threads on the screw
- 2-42. To adjust the tappet to the intake valve of a 4-stroke cycle engine, the piston must be in what position?
1. On the intake stroke
 2. On the compression stroke
 3. Between the compression and power strokes
 4. Between the intake and compression strokes
- 2-43. What is the most frequent maintenance requirement for rocker arms?
1. Reaming the bushings in the rocker arms
 2. Inspecting the rocker arm ends for wear
 3. Checking tappet clearances and locknut tightness
 4. Replacing tappet adjusting screws and locknuts
- 2-44. After setting a tappet clearance and locking the adjusting screw with the locknut, what is your next step?
1. Recheck the clearance
 2. Adjust the next tappet
 3. Warm the engine up and reset the clearance
 4. Check the manufacturer's manual to see if the clearance is correct
- 2-45. When a lash adjuster is adequately supplied with oil, what will most likely cause it to operate noisily?
1. Excessive clearance
 2. Broken parts
 3. Dirt, resin, or abrasive particles
 4. Missing check ball or spring
- 2-46. Which of the following actions should you take to insert a camshaft into the camshaft recess?
1. Rotate it as you push it in
 2. Shake it up and down
 3. Apply grease to it
 4. Hit it with a sledge
- 2-47. Why is it necessary to scrape around the top of a cylinder bore before pulling the piston?
1. To remove any metal ridges and carbon deposits
 2. To increase clearance for the piston
 3. To remove abrasive particles and gum
 4. To free the piston rings

- 2-48. To scrape the top of a cylinder bore before pulling the piston, you should use which of the following tools?
1. A power grinder
 2. A file
 3. A metal scraper
 4. An emery cloth
- 2-49. When using a brass drift to remove a frozen piston ring, you must avoid damaging which of the following parts?
1. The ring
 2. The drift
 3. The camshaft
 4. The land
- 2-50. Piston ring gaps are measured (a) with what tool and (b) in what location?
1. (a) A micrometer;
(b) on the piston
 2. (a) A feeler gauge;
(b) in the cylinder liner
 3. (a) A feeler gauge;
(b) in the vise
 4. (a) A micrometer;
(b) in the cylinder liner
- 2-51. In addition to ring gap, what other factor must you measure to ensure correct ring fit?
1. Ring end gap
 2. Ring-to-land clearance
 3. Ring width
 4. Ring circumference
- 2-52. Operation of an internal combustion engine above the specified temperature limits may result in which of the following problems?
1. Lack of lubrication of the cylinder walls
 2. Low cylinder temperatures
 3. Increased oil viscosity
 4. Low oil temperatures
- 2-53. If the oil flow to a piston is restricted, where will the deposits caused by oxidation or the oil form?
1. On the underside of the piston crown
 2. Behind the compression rings
 3. On the piston walls
 4. On the topside of the piston crown
- 2-54. You are installing a new sleeve bearing. Which of the following procedures will make it easier to insert the new sleeve bearing?
1. Apply plenty of grease to the bushing
 2. Shrink the piston with dry ice
 3. Shrink the sleeve bearing with dry ice
 4. Heat the sleeve bearing in the oven
- 2-55. What is the primary reason piston pin bushings are reamed?
1. To enlarge oil holes
 2. To obtain correct lubricating flukes
 3. To obtain proper bore clearance
 4. To correct oil hole positioning
- 2-56. To measure the clearance between a piston pin and its bushing, which of the following items should you use?
1. Micrometers
 2. Feeler gauges
 3. Leads
 4. Prussian blue

- 2-57. When inserting new piston pin bushings, what are the three things you must check?
1. Alignment, clearance, and appearance
 2. Cleanliness, appearance, and clearance
 3. Appearance, alignment, and cleanliness
 4. Cleanliness, alignment, and clearance
- 2-58. Crankshaft journals that exceed the specified tolerances for out-of-roundness should be refinished by which of the following means?
1. Stoning
 2. Grinding
 3. Filing
 4. Scraping
- 2-59. A rough spot or slight score on a crankshaft journal should be removed by dressing with which of the following materials?
1. A fine sandpaper
 2. A crocus cloth
 3. A fine oilstone
 4. Both 2 and 3 above
- 2-60. What instrument is used to take crankweb deflection readings?
1. A feeler gauge
 2. An outside micrometer
 3. A strain gauge
 4. A gauge block
- 2-61. Impending bearing failures may be indicated by which of the following factors?
1. Lower than normal lubricating oil pressure and temperature
 2. Higher than normal lubricating oil pressure and temperature
 3. Lower than normal lube oil pressure and higher than normal lube oil temperature
 4. Higher than normal lube oil pressure and lower than normal lube oil temperature
- 2-62. What is the recommended corrective action for journal bearings that have small raised surfaces or minor pits?
1. Replace the bearing
 2. Stone down the raised surfaces and fill in the pits with solder
 3. Grind the surfaces with a hand grinder
 4. Smooth down the surfaces with a bearing scraper
- 2-63. Before installing new or restored bearings, what should you do?
1. Wipe oil on the journal surfaces only
 2. Wipe oil on the bearing surfaces only
 3. Ensure that the surfaces are clean and place a film of clean oil on both the journals and bearing surfaces
 4. Clean the bearings with solvent and wipe dry
- 2-64. Certain information is indicated by markings placed on each half of the connecting rod bearings when they are removed from an engine. These markings ensure that the halves will be installed in their original positions. Which of the following is an example of sufficient and necessary information being shown by a marking?
1. No. 2 cylinder
 2. No. 2 cylinder. upper half
 3. No. 2 cylinder, engine No. 311645
 4. Upper half, engine No. 311645
- 2-65. Which of the following procedures are acceptable for tightening connecting rod bolts?
1. Bolt elongation and bearing cap compression
 2. Bearing cap compression and slugging wrench tightening
 3. Torque wrench tightening and bolt elongation
 4. Slugging wrench tightening and using a wrench extender

- 2-66. Which of the following means of determining clearances will NOT leave an impression in the soft bearing metal?
1. Leads
 2. Shim stock
 3. Feeler gauge
 4. Plastigage
- 2-67. Which of the following senses is NOT used by the diesel engine troubleshooter?
1. Smell
 2. Sight
 3. Hearing
 4. Taste
- 2-68. Frequently, instruments give the first symptoms of trouble. To detect a variation from normal, the troubleshooter must take which of the following actions?
1. Memorize the specified engine-operating instructions
 2. Report the instrument readings to the EOWW
 3. Read the instruments and record their indications regularly
 4. Each of the above
- 2-69. Which of the following actions will be the greatest aid in detecting minor leakage?
1. Standing watch
 2. Conducting material inspection
 3. Conducting administrative inspection
 4. Conducting routine cleaning
- 2-70. When a diesel engine can neither be cranked nor barred over, which of the following troubles is most probably indicated?
1. A depleted air supply
 2. An open cylinder relief valve
 3. An improperly engaged turning gear
 4. An out-of-time air-starting motor
- 2-71. Which of the following is a symptom of excessive clearance between a piston and its cylinder.?
1. Piston slap
 2. Less oil consumption
 3. Minimal carbon deposits
 4. Each of the above
- 2-72. Which of the following factors could cause piston seizure?
1. Excessive temperatures
 2. Excessive cooling
 3. Decrease in the rate of oxidation
 4. Both 2 and 3 above
- 2-73. The best method for locating cracks in connecting rods is with an inside micrometer.
1. True
 2. False
- 2-74. Which, if any, of the following measurements, indicates that main bearing wear has occurred?
1. Clearance between the bridge gauge and shaft
 2. Variation between the measured clearance and the clearance stamped on the bearing housing
 3. Variation between last crank web deflection and present
 4. None of the above
- 2-75. When troubleshooting diesel engines, you should associate lack of engine power with which of the following systems?
1. Lubrication
 2. Cooling
 3. Fuel
 4. Each of the above